resistance component of the source resonator, thus decreasing an effective resistance component of the source resonator, and increasing a Q factor. The active element may be expressed as a negative resistance to indicate the effective resistance component is decreased.

[0132] A passive element may increase the amount of energy expended due to a resistance component in the source resonator. As the amount of energy expended increases, a Q factor may decrease. Using the passive element may enable an effective resistance component of the source resonator to be increases and thus, the Q factor may decrease.

[0133] The RX end **1120** may adjust the Q factor by adjusting the amount of energy compensated for through the active element. The RX end **1120** may quantize the Q factor by adjusting the amount of energy compensated for in the target resonator, and may modulate information according to the quantized Q factor.

[0134] The RX end **1120** may adjust the Q factor by increasing the amount of energy expended in the target resonator through the passive element. The RX end **1120** may quantize the Q factor by adjusting the amount of energy expended in the target resonator, and may modulate information according to the quantized Q factor. The RX end **1120** may transmit information to the TX end **1110** through a variation of the Q factor of the target resonator.

[0135] The RX end **1120** may perform communication in an a full duplex scheme by transmitting information to the TX end **1110** through a variation of the Q factor of the target resonator in conjunction with receiving information from the TX end **1110** through a mutual resonance.

[0136] FIG. **12** illustrates a graph illustrating one waveform of a signal applied to a source resonator when a Q value of the source resonator varies in a communication system using wireless power.

[0137] When a source resonator and a target resonator are strongly coupled, a waveform of a signal applied to the source resonator of a low Q may be different from a waveform of a signal applied to the source resonator of a high Q after compensating for energy expended in the target resonator. The waveform of a signal applied to the source resonator of a high Q may be greater in magnitude than the waveform of a signal applied to the source resonator of a low Q. A transmission TX end may demodulate information transmitted from a reception RX end through a variation of a waveform. By adjusting the Q factor of the target resonator, a variation of a waveform of a signal applied to the source resonator may be diversified.

[0138] When the source resonator and the target resonator are weakly coupled, the waveform of the signal applied to the source resonator of a low Q factor may be different from the waveform of the signal applied to the source resonator of a high Q factor after compensating for energy expended. The TX end may demodulate information transmitted from the reception RX end through a variation of a waveform.

[0139] The units and other elements described herein may be implemented using hardware components, software components, or a combination thereof, in some embodiments. For example, a processing device may be implemented using one or more general-purpose or special purpose computers, such as, for example, a processor, a controller and an arithmetic logic unit, a digital signal processor, a microcomputer, a field programmable array, a programmable logic unit, a microprocessor or any other device capable of responding to and executing instructions in a defined manner. The processing device may run an operating system (OS) and one or more software applications that run on the OS. The processing device also may access, store, manipulate, process, and create data in response to execution of the software. For purpose of simplicity, the description of a processing device is used as singular; however, one skilled in the art will appreciated that a processing device may include multiple processing elements and multiple types of processing elements. For example, a processing device may include multiple processors or a processor and a controller. In addition, different processing configurations are possible, such as parallel processors.

[0140] The software may include a computer program, a piece of code, an instruction, or some combination thereof, for independently or collectively instructing or configuring the processing device to operate as desired. Software and data may be embodied permanently or temporarily in any type of machine, component, physical or virtual equipment, computer storage medium or device, or in a propagated signal wave capable of providing instructions or data to or being interpreted by the processing device. The software also may be distributed over network coupled computer systems so that the software is stored and executed in a distributed fashion. In particular, the software and data may be stored by one or more computer readable recording mediums. The computer readable recording medium may include any data storage device that can store data which can be thereafter read by a computer system or processing device. Examples of the computer readable recording medium include read-only memory (ROM), random-access memory (RAM), CD-ROMs, magnetic tapes, floppy disks, optical data storage devices. Also, functional programs, codes, and code segments for accomplishing the example embodiments disclosed herein can be easily construed by programmers skilled in the art to which the embodiments pertain based on and using the flow diagrams and block diagrams of the figures and their corresponding descriptions as provided herein.

[0141] A number of examples have been described above. Nevertheless, it should be understood that various modifications may be made. For example, suitable results may be achieved if the described techniques are performed in a different order and/or if components in a described system, architecture, device, or circuit are combined in a different manner and/or replaced or supplemented by other components or their equivalents. Accordingly, other implementations are within the scope of the following claims.

What is claimed is:

1. A communication device using wireless power, the communication device comprising:

a controller configured to control mutual resonance between a target resonator and a source resonator;

a demodulator configured to demodulate information transmitted from the source resonator based on an amount of energy received from the source resonator; and

a modulator configured to modulate information based on the mutual resonance.

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